WHAT IS CLAIMED IS:

1.   A method comprising:

iteratively decoding a turbo product code (TPC) code word; and

terminating the iterative decoding when the TPC code word satisfies a cyclic redundancy check (CRC).

2.   The method of claim 1, wherein iteratively decoding the TPC code word comprises iteratively decoding the TPC code word using a soft decision algorithm and a TPC decoder.

3.   The method of claim 2, wherein the soft decision algorithm is a Bahl, Cocke, Jelinek, and Raviv (BCJR) algorithm.

4.   The method of claim 2, wherein the soft decision algorithm is a soft output viterbi algorithm (SOVA).

5.   The method of claim 4, wherein iteratively decoding the TPC code word further comprises iteratively decoding a TPC code word with single parity check (TPC/SPC).

6.   The method of claim 4, wherein iteratively decoding the TPC code word using the SOVA and the TPC decoder further comprises:

generating a probability indicative parameter, using the SOVA, for each of a plurality of sequences of bits from the TPC code word;

de-interleaving the TPC code word to generate a de-interleaved TPC code word;

decoding the de-interleaved TPC code word, using the TPC decoder, as a function of the probability indicative parameter from the SOVA to generate a decoded TPC code word; and

re-interleaving the decoded TPC code word for use by the SOVA in updating the probability indicative parameter for each of the plurality of sequences of bits.

7. The method of claim 6, and further comprising performing the CRC on the decoded TPC code word.

8. The method of claim 7, and further comprising terminating the iterative decoding prior to the TPC code word satisfying the CRC if a predetermined number of iterations between the SOVA and the TPC decoder have been completed.

9. The method of claim 8, and further comprising performing an error correcting code (ECC) on the decoded TPC code word.

10. The method of claim 1, and before the step of iteratively decoding the TPC code word, further comprising appending CRC data bits to one of a plurality of code blocks of the TPC code word.

11. The method of claim 10, and after the step of appending the CRC data bits to one of the plurality of code blocks of the TPC code word, further comprising adding a row and a column of parity bits to each of the plurality of code blocks of the TPC code word.

12. A data storage system configured to implement the method of claim 1.

13. The data storage system of claim 12, wherein the TPC code word contains 512 bytes of user data.

14.   A communication system configured to implement the method of claim 1.

15.   An apparatus comprising:

an iterative decoder configured to iteratively decode a turbo product code
(TPC) code word;

cyclic redundancy check (CRC) implementing circuitry configured to
perform a CRC on the TPC code word;

wherein the iterative decoder is configured to terminate the iterative
decoding when the TPC code word satisfies the CRC.

16.   The apparatus of claim 15, wherein the iterative decoder comprises:

soft decision algorithm implementing circuitry; and

a TPC decoder.

17.   The apparatus of claim 15, wherein the soft decision algorithm
implementing circuitry is configured to implement a soft output viterbi algorithm
(SOVA).

18.   The apparatus of claim 16, wherein the TPC code word is a TPC code word
with single parity check (TPC/SPC), and wherein the iterative decoder is
configured to iteratively decode a TPC/SPC code word.

19.   A method comprising:

providing a plurality of square code blocks of a turbo product code (TPC)
code word of user data; and

appending cyclic redundancy check (CRC) data bits to one of the plurality
of code blocks.

20.   The method of claim 19, and further comprising:

iteratively decoding the TPC code word; and

terminating the iterative decoding when the TPC code word satisfies a

cyclic redundancy check (CRC).